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The Effects of the Israeli-Palestinian Conflict on Water Resources in the Jordan River Basin

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T

oday the great global challenges, such as environmental change or the depletion of natural resources, are turning into strategic issues, capable of influencing international peace and security.¹ The connection between security and the environment comes to the fore wherever a struggle for the control of natural resources aggravates conflictual situations or, conversely, a conflict causes



the destruction of natural resources; or, again, when the increasing frequency of extreme climatic events determines migrations of so-called “environmental refugees”, and lead communities to compete for the two fundamental resources for survival: land and water. In 1993, Myers indicated environmental degradation as a potential risk for international peace and security, although he did not regard it as the exclusive cause of political instability.

National security is no longer about fighting forces and weaponry alone. It relates to water-sheds, croplands, forests, genetic resources, climate and other factors rarely considered by military experts and political leaders, but that taken together deserve to be viewed as equally crucial to a nation’s security as military prowess.²

An emblematic case of the connection between security and the environment in the Mediterranean is the Israeli-Palestinian conflict. Here we find both competition for land and water – the one inseparable from the other – and the devastating effects of prolonged conflict on the environment and natural resources. A historical reconstruction of the water dispute in the Middle East shows that a situation of prolonged political instability has led Israel to follow a politics of appropriation of the main surface and underground resources of the Jordan basin. This politics, aimed at guaranteeing the country’s hydraulic security in a hostile regional context, has legitimized a race for the exploitation of water resources among the other countries along the lower course of the Jordan (Jordan and the Palestinian Territories); a race that has shoved into the background the issue of saving and protecting water resources.

Today, the effects of global problems such as climatic change tend to be amplified at the regional scale. This is because the ancient war for water now takes place within an environmental context subjected to strong anthropic pressure and gradual parching of the soil. Water

¹ B. Buzan, O. Waever, J. Wilde, *Security. A New Framework for Analysis*, London 1998.

² N. Myers, *Ultimate Security. The Environmental Basis of Political Stability*, Norton, New York, 1996.

thus becomes a strategic bone of contention, capable of influencing peace and regional securities.

Thus, the connection between security and the environment is increasingly influenced by current global dynamics; a challenge that would call for an environmental management at the global scale that our weak international institutions are incapable of providing. We hear many declarations of principles, but there is no consensus on the strategies to be followed to face environmental crises and their political and economic effects.

The water of discord

The environmental context of the geopolitics of water in the Middle East – that is, the political rivalry between the countries of the Jordan basin as regards the parceling out of the river's water and the exploitation of underground hydrogeological resources – is one of aridity and scarce precipitation resulting in low-flow and highly saline watercourses.

The Jordan basin extends from Mount Hermon in the north to the Dead Sea in the south. It lies within the territories of five states: Syria, Israel, Palestine, Lebanon, and Jordan. I will mainly focus, however, on the countries along the lower course of the Jordan, viz., Israel, Jordan, and the Palestinian Territories of Gaza and West Bank, which appear to be more dependent on the water of the Jordan river and more exposed to water scarcity.

The Jordan originates from the slopes of Mount Hermon. It receives three tributaries along its upper course: the Hasbani, the Dan, and the Banyas. The river then runs across northern Israel, through Lake Tiberias, and then southward. About 6.5 kilometers from Lake Tiberias it receives its main tributary, the Yarmuk, which marks the boundary between Syria and Jordan and then that between Israel and Jordan. Immediately after its confluence with the Yarmuk, the Jordan runs in its homonymous valley for about 110 kilometers. This stretch marks the boundary between Jordan and Israel, and then that between Jordan and West Bank. The river finally flows into the Dead Sea, over 400 meters below sea level. The flow of the Jordan is

subject to frequent seasonal and interannual variations. It is about 1500 millions of cubic meters per year, so a mere 2% of that of the Nile and 6% of that of the Euphrates (Fig. 1).

The dispute over the Jordan basin waters precedes the Arab-Israel conflict, but it intensified in the years immediately following the birth of the state of Israel, especially since 1953, when Israel began the construction of the “National Water Carrier”. This great aqueduct, destined to convey the waters of the Jordan stored in Lake Tiberias along the Mediterranean coast all the way to the distant and arid Negev, diverts the course of the river outside of its basin, de facto snatching it from the control of the other countries of the basin (Lebanon, Syria, and Jordan).³

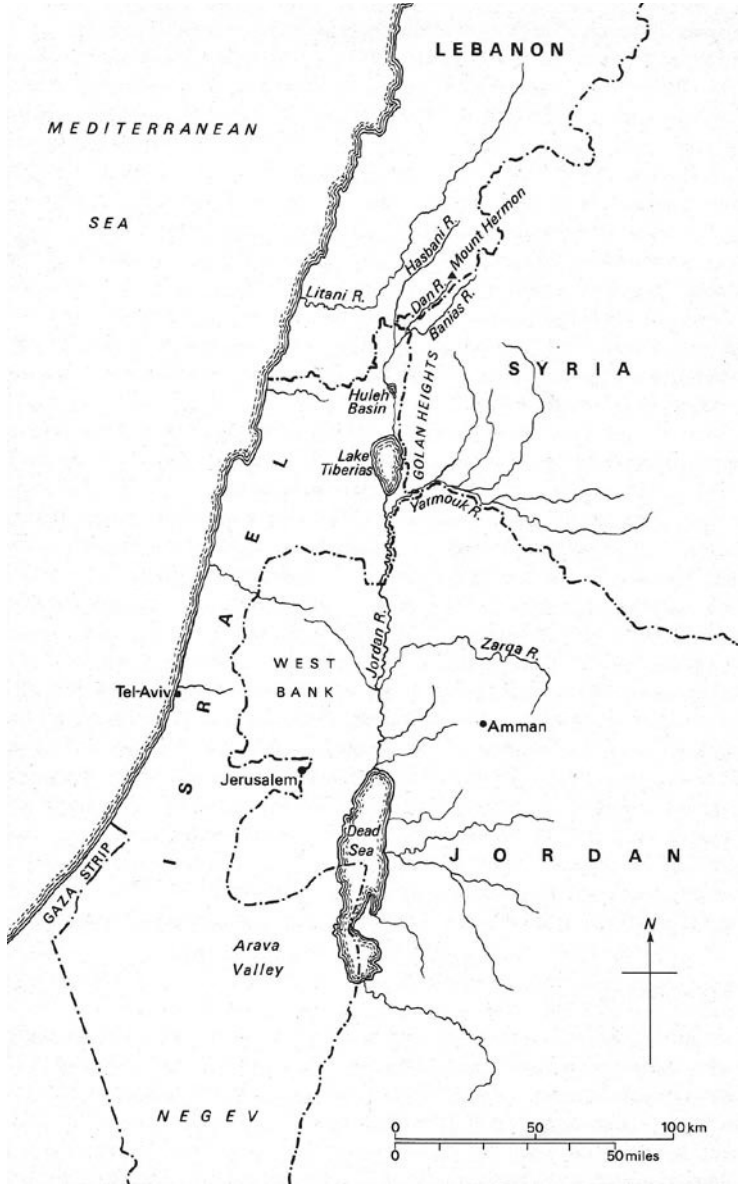
As the United States gradually came to the fore as a hegemonic actor on the Middle Eastern scene, they sought to come up with solutions for the main regional strategic issues. Realizing the conflict potential inherent in the question of control of water resources, they sought to act as mediators. The Johnston plan, presented in 1955 by an envoy of President Eisenhower, was the result of a careful hydrological analysis and an accurate negotiation work in which the chancelleries of all the countries of the basin were involved. The plan proposed an allocation of the water of the Jordan and its tributaries taking account both of the available water and of the supplements required to meet the water needs of all the regional actors involved.

The Johnston plan eventually failed, essentially for political reasons. Israel regarded the quotas it was assigned under the plan as insufficient, insofar as they did not take account of the increasing inflow of diaspora Jews. The Arabs, in their turn, refused to enter the agreement as they would thereby be implicitly recognizing the existence of Israel. Furthermore, the Arab countries saw the United States’ mediation as an attempt to consolidate Israel’s position in the region.⁴ In fact, the geopolitical objectives of security and control over

³ The Lowdermilk plan, submitted in 1944 with the support of the World Zionist Organization, was the first plan for the partition of of the Jordan basin water.

⁴ United States pressure also takes the form of promises of technical and financial aid for the carrying out of hydraulic projects.

Figure 1. The Jordan river system



Source: M.R. Lowi, *Water and Power*, Cambridge University Press, Cambridge 1993

water resources outweighed strategic considerations, which would have called for an effort to reach an agreement on the allocation of the Jordan waters and the undertaking of joint projects.

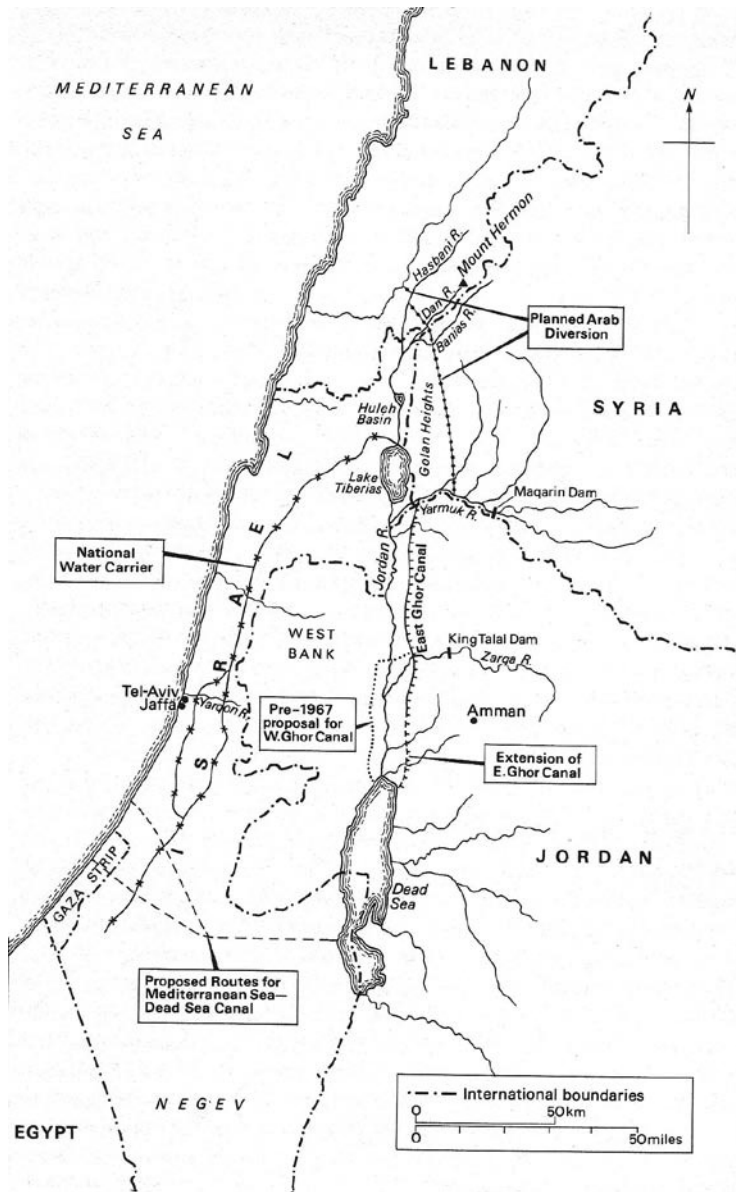
The rejection of the Johnston plan put an end to all hopes for regional cooperation in the water sector and was followed by the launching of national hydraulic plans (Fig. 2). The resulting dynamics took the form of a zero-sum game where water gained by one country was water lost to the others. The consequences were an amplification of political tensions and a strong pressure on water sources. Thus, over the decades water became an increasingly scarce resource and a limiting factor for the socio-economic development of the region.⁵

Israel completed its National Water Carrier in 1964. In the same year, the Arab countries responded by launching a plan to divert the waters of the Banyas and the Hasbani, both tributaries of the upper course of the Jordan, to the Yarmuk river. Their objective was twofold: on the one hand, to increase the flow of the Yarmuk, which is mainly utilized by two Arab countries (Syria and Jordan); on the other, to reduce the flow of the Jordan, which feeds Israel's National Water Carrier, by ca. 35%. Israel saw the Arab diversion project as a serious attack against its water interests. After several battles along the Syrian border – two months before the outbreak of the Six Day War – the Israeli army bombed the Arab deviation structures.

Jordan – the weakest actor, as regards both water availability and geographical position within the basin – turned to the Yarmuk for the construction of its own national waterway. It deviated the river at Adasya and conveyed its waters to the Jordan Valley through the East Ghor Canal. A joint project with Syria for the creation of a large basin – the Maqarin dam – to gather the waters of the Yarmuk, intended to rescue Jordan from its summer water emergency, met with firm opposition from Israel, which feared a reduction of the Jordan's flow. In this case, too, no punches were pulled in the struggle

⁵ A. Amendola, G. Autiero, "Gestione delle risorse comuni e incentivi alla cooperazione", in *L'acqua nei paesi del Mediterraneo. Problemi di gestione di una risorsa scarsa*, E. Ferragina (ed.), Il Mulino, Bologna 1998, p. 198.

Figure 2. The Jordan basin: major existing and proposed projects



Source: M.R. Lowi, *Water and Power*, Cambridge University Press, Cambridge 1993

for the control of water resources: the first structures of the Maqarin dam were destroyed shortly before the Six Day War.⁶

The 1967 war and the changes in the balance of power within the Jordan basin

The 1967 war, although it was not a “war for water”, did have water as one of its main stakes. The conflict was concluded with Israel acquiring a positional advantage along the upper Jordan, and thus *de facto* taking control of the main regional water resources. Israel achieved this through its occupation of Golan, which is crossed by the tributaries of the upper course of the Jordan (the Dan and Banyas), and West Bank, with the rich aquifers of Mountain, and the coastal aquifer of Gaza. Through its control of Golan, Israel gained total control of the Jordan and was able to use water as a negotiating weapon. The occupation of this strategic area thwarted the Arab countries’ water-diverting plans. The only source that remained outside of Israel’s control was the Hasbani, which originates in southeast Lebanon.

Among the Arab countries, Jordan was the one whose water problems were most aggravated by the conflict. It lost West Bank and, as a consequence, its access to the Mountain aquifers; its water needs were increased by the immigration of about 300,000 Palestinian refugees; and it suffered the effects of the extension of Israeli control along the north bank of the Yarmuk from 6 to 12 kilometers. Jordan was forced to accept the new geopolitical situation as ineluctable. The water dispute thus entered into a pragmatic phase during which the country, aware of its weakness, strove to maximize its access to ever scarcer water resources through technical agreements with Israel that did not challenge the new status quo.

As to Israel, even before 1967 it had already depended for its water supply on the Mountain (Yarkon-Taninim) aquifers in the western part of West Bank, whose water could be tapped within the Green Line by means of very deep wells.⁷ After 1967, Israel took

⁶ E. Ferragina, *L'acqua nei paesi del Mediterraneo* cit., p. 337.

direct control of the aquifer and introduced strict restrictions on its use by the local Palestinian populations, notably:

- The digging of wells was prohibited under military ordinance 158 of 30 October 1967, without permission from the Israeli authorities. Such permission was only given sporadically, and only for domestic use.

- Pumping was forbidden along the mountain ridge overlying the Yarkon-Taninim aquifer.

- The use of earlier wells adjoining Israeli wells was prohibited.

These restrictions were imposed because the aquifer flows westward, and the West Bank rainwater hence feeds into areas within Israeli territory. Thus, these limitations to Palestinian exploitation of the area uphill of the aquifer resulted in an increased availability of water in the downhill area exploited by Israel. The years after the occupation witnessed a de facto congealing of Palestinian water consumption, which actually increased, but very slightly, especially when compared with the Palestinian population's high rate of demographic growth.

New perspectives for the settling of the water dispute appeared to open with the Oslo agreement of 1993, which affirmed the importance of the environment and water resources in the peace process, laying the foundation for future cooperation in this sector. The pro tempore agreement of 1995 (Oslo II) marked a turning point in water negotiations. For the first time, Israel recognized the Palestinians' right to a quota of West Bank's water resources, although they put off the allocation plan to the final phase of the negotiations. This delay was partly due to the fact that the water question is indissolubly connected with other key issues that were also put off until the final phases of the negotiations, such as refugees' right to return, the tracing of the boundaries of the future Palestinian state, and the final status of East Jerusalem. All these aspects could potentially exert a decisive influence on the final allocation of water quotas to the two populations.

⁷ The Green Line marked Israel's boundary before the outbreak of the Six Day War in 1967.

Oslo II also marked the beginning of an autonomous institutional organization of the water sector, with the creation of the Palestinian Water Authority and the passing of the 2002 law on water, which formally incorporated the principles of environmental sustainability and integrated management of water resources. Due to the lack of democracy of Palestinian institutions, however, the law was passed without previous consultation of local administrations. This resulted in a lack of coordination between the Palestinian Water Authority, which draws the guidelines of water policies; the Ministry of Local Government, which manages the urban water supplying networks; local administrations; and private individuals using the water for agricultural purposes. In the years following the Oslo agreements, the Water Authority only exercised a weak control over the sector, limiting itself to the application of counters to the wells placed within the territory of the autonomy, and to putting a tax on extraction in excess of assigned quotas; without, furthermore, being actually able to enforce even these measures.

The reform of the water sector in Palestine was complicated by the limited autonomy of the Water Authority. The W.A.'s action was bogged down by innumerable limitations, not the least being the need to supplement the small water quotas assigned to the Palestinians with quotas purchased from the Israeli water agency Mekorot. These problems were compounded by the territorial fragmentation of West Bank, which complicated infrastructural action, and by technical and organizational shortcomings in the management of the water sector. As a consequence, no measures were taken to expand and maintain the water supplying network, to control extraction, or to safeguard water resources.

The failure of all attempts at cooperation in environmental protection in the years following the signing of the Oslo agreement has been largely determined by the two populations' different perceptions of the objectives of the peace process and its modes of enactment. The Israelis are mainly interested in setting up a regional cooperation that would allow them to dodge the thorny issue of the partition of the water of the Mountain aquifer. This explains their attempts to revive major water transfer projects such as the importation of water from Turkey via Antalya, the Peace Canal,

and the proposed Red Sea-Dead Sea conduit, as well as their huge investments in research on new desalting technologies.⁸ At the same time, Israel is inclined to limit its cooperation with the Palestinians to technical aspects connected to the qualitative deterioration of water resources, such as the joint management of wastewater collection and processing systems by Palestinian villages and Israeli settlements.

The Palestinians, on their part, although they agree on the need for cooperative effort to safeguard water resources, see the problem from a political perspective. They prioritize gaining recognition of their rights to the Mountain aquifer and the drawing up of an allocation plan. This explains the refusal of Palestinian municipalities to cooperate with the Israeli settlements within the Palestinian Territories, as this would imply recognizing the legitimacy of the colonies. Water has become, one again, the terrain on which political distances and contrasting objectives are gauged and weighed, and this amplifies the pressure on resources.

Furthermore, ever since the second Intifada, political emergency has caused what limited control and regulation power had existed previously in the sector to lapse, allowing non-sustainable ways of exploiting water resources to spread even more.

Unequal access to water and its environmental repercussions on water resources

Renewable water resources in the countries of the lower course of the Jordan (Israel, Jordan, West Bank, and Gaza) amount to about 3.3 billions of cubic meters. Of these, Israel controls about 2 billion, Jordan 1 billion, and Palestine a mere 296 million.⁹ This translates

⁸ The Peace Channel project, launched by Sadat in 1978, conveys water from the Nile to Sinai. An extension to Israel is envisaged. The Red-Dead project, instead, aims at digging a canal from the Red Sea to the Dead Sea. The Dead Sea is to be used as a reservoir for the Red Sea Water. The plan also envisages the building of desalting plants exploiting the gradient between the two basins.

⁹ The data on Israel are from the Water Resources Institute, those for Palestine from the Central Bureau of Statistics. They are updated to 2005.

to an average per capita availability of 157 cubic meters a year for Jordan, 344 for Israel, and 93 for the Palestinians. All three countries are far below the minimum annual threshold of 1000 cubic meters per capita recommended by the World Bank.¹⁰

These differences in water availability among the countries of the lower course of the Jordan depend both on the balance of power between them and on positional advantages within the basin. Jordan, a weak strategic and military actor compared to Israel, is placed at a further disadvantage by its downstream position along the river. The waters of the Jordan River running through Jordanian territory after flowing out of Lake Tiberias are subject to strong upstream extraction by Israel affecting its quality as well as its quantity. Because of the limited flow of the Jordan's lower course and the many saltwater tributaries it receives, the river's contribution to Jordan's water balance is irrelevant.

Thus, over the years the country has been facing an increasing gap between water supply and demand. In some areas of the northeast plateaus, water extraction for agricultural use has exceeded local recharge rates. An equally strong pressure on underground water is observable in urban areas, especially in the Amman-Zarqua-Wadi Sir conurbation. By 2000, about 2500 wells all over the country were drawing water in excess of aquifer recharge rates.¹¹

One of the environmental repercussions of the water crisis is the growing exploitation of the main fossil aquifer of the country, the Disi-Mudawarra, on the border with Saudi Arabia. The failure of cooperation attempts with neighboring countries – first and foremost Jordan's 1994 peace treaty with Israel, which failed to lead to the launching of joint projects – has led Jordan to set its sights on this huge fossil deposit to meet the capital's water needs.

As to the Palestinian Territories of Gaza and West Bank, the water situation there is aggravated by Israeli occupation. The

¹⁰ E. Ferragina, D. Quagliarotti, "L'ambiente. Cooperazione e finanziamenti allo sviluppo sostenibile nel Mediterraneo", in *Rapporto sulle economie del Mediterraneo*, P. Malanima (ed.), Il Mulino, Bologna 2007, pp. 185-212.

¹¹ M. Hadadin, *Water Resources in Jordan*, Resources for the Future, Washington 2006, p. 98.

resources presently allocated to the Palestinian population of West Bank include 80 million cubic meters of underground water and 50 MCM of superficial water, or a total of 130 MCM. A clear example of unequal access of Israelis and Palestinians to water sources is the fact that the Palestinian Territories, although most of the Mountain aquifer lies within their territory, exploit the least quantity of its water. Israel utilizes 57.1% of the total groundwater resources, the Palestinians only 8.2%. The daily average per capita consumption is 270 liters for the Israelis, 93 for the Palestinians.¹²

There is also a strong gap in domestic consumption: 98 cubic meters per capita for the Israelis, 34 for the Palestinians. Because of frequent cutoffs in water supplies and leaks along the pipelines, in the Palestinian towns this already limited consumption is further reduced to 50 liters per day: half of what the World Health Organization regards as the minimum required to meet basic hygienic and sanitary standards. The gap is even more dramatic when we relate the figures for water consumption of the Palestinians and the Israeli colonists to their respective populations (2.3 millions vs. 230,000). The colonists are consuming 5 times more water than the Palestinians.

Most of the Palestinian wells were dug in the Fifties or Sixties, when West Bank was under Jordanian control. They are of limited depth, plunging down only slightly below the top of the aquifer, and are hence exposed to gradual drying up as a result of the operating of the Israeli wells, which are a lot deeper. During the Sixties, these wells contributed to a gradual change in the Palestinian rural landscape, characterized by a transition from surface irrigation to drop-by-drop irrigation and the spread of intensive agriculture.

Investments in the hydraulic sector have been declining over the last decades, as nothing has been done after 1967 for the maintenance of water infrastructures. Officially, 69% of Palestinian villages are reached by the hydraulic network, but only 46% of these are constantly supplied. In the rest, the water supply is often interrupted. The networks are obsolete and losses are higher than

¹² The Palestinian Environmental NGO's Network (Pengen), *The Wall in Palestine*, Jerusalem 2003, p. 53.

45%. Because of the poor condition of the infrastructures, the water supply is exposed to contamination from wastewater and garbage from the Palestinian villages and the Israeli settlements.

Increasing restrictions on free circulation within the Palestinian Territories of Gaza and West Bank often prevents Palestinian villages from taking their waste to dumping areas. This results in garbage accumulation that causes health problems and contaminates groundwater. The poor condition of sewage systems adds to the pollution. Both the Palestinian villages and the Israeli settlements are often forced to discharge their waste water in watercourses or allow it to rise above the safety level in cesspools. Thus, the years of Israeli occupation have brought on a general decline of the environmental situation in the Palestinian Territories. There is no system for the collection and disposal of solid refuse and wastewater, and the quality of water sources keeps going down.

An emblematic example of the damage done to water sources is observable in the Gaza Strip, which extends for 45 kilometers along the coast of the Mediterranean and has one of the highest demographic densities in the world, with 1,300,000 Palestinians – 900,000 of whom refugees – living within an area of 360 square kilometers. Until their dismantling in 2006, the Israeli colonies used about 35% of the water of the coastal aquifer underlying the Strip, causing environmental degradation through excessive pumping. The water situation in this area has further deteriorated since 1996, when the Palestinian population reacted to the end of Israeli control by digging about 200 unauthorized wells. The increased extraction has resulted in a lowering of the aquifer and the consequent intrusion of seawater, which has made the aquifer unusable for human and agricultural consumption. Since water, whether superficial or subterranean, knows no political boundaries, the environmental disaster of Gaza has had serious repercussions in Israel as well. As some researches have shown, some two thirds of wells in central Israel are polluted by infiltration of unprocessed wastewater from West Bank.¹³

¹³ R. Twite, “A Question of Priority – Adverse Effects of the Israeli-Palestinian Conflict on the Environment of the Region over the Last Decade”, in *Security and*

The outbreak of the Second Intifada in September 2000 had further environmental repercussions. While the destruction of harvests and olive groves, the filling up of wells, and damages to hydraulic infrastructures cannot be regarded as a deliberate strategy that Israel is enacting against the Palestinian population, they are certainly a heavy cost that natural resources have to pay in a no-holds-barred conflict where water, once again, has become an instrument of collective punishment and political blackmail.

The construction of the Barrier and its impact on water resources

In 2001, Israel began the construction of a wall to prevent Palestinian suicide attackers from accessing the territory of Israel. The wall is planned to run for 790 km in the West Bank (the first phase involved the districts of Jenin, Tulkarem, and Qalqilya) and will affect about 500,000 Palestinians, or ca. 22% of the overall population of West Bank.¹⁴

The 8-meter-tall barrier does not run along the 1967 boundary, but pushes about 6 kilometers into West Bank, forming an about 12,000-hectare cushion zone between the wall and the Green Line. This zone is thus de facto isolated from the rest of the Palestinian territory. In 2003, Israel announced completion of the first 27 kilometers of the wall. The lands the wall runs through, with its security systems (barbed wire, electronic control systems, etc.), are under temporary seizure by the Israeli authorities, as the building of the wall is regarded as a temporary measure and, as such, not in violation of the interim agreement signed in 1995, which prohibits unilateral modifications of the boundaries.

Environment in the Mediterranean, H. Gunter Brauch, P.H. Liotta., A. Marquina, P.F. Rogers, M. El-Sayed Selim (eds), Springer, Berlin 2003, pp. 563 - 572.

¹⁴ On 9 July 2004, the Le Hague International Justice Court declared the Wall illegal and ordered its destruction. On 20 July, the National Assembly of the United States endorsed the Court's judgment with 150 votes in favor, 6 contrary, and 6 abstained.

In this first phase, the building of the wall led to the destruction of some 30 kilometers of infrastructure, the uprooting of 102,320 trees, the demolition of 85 shops, and the loss of 14 hectares of cultivable land. The directly affected communities – that is, those residing within the wall or in the area between the wall and the Green Line – are about 65, for a total of about 206,000 individuals.¹⁵ The uncertainty introduced by the wall has contributed to the deterioration of living conditions and aggravated poverty. According to a World Bank report, the number of people with a daily income of less than \$ 2 (the international poverty threshold) increased from 600,000 to 1,200,000 between 2000 and 2001. The percentage of the population below the poverty threshold rose from 20% before the outbreak of the Second Intifada to more than 60% in 2002.¹⁶

The social and economic disruption and the isolation of Gaza and West Bank has enormously increased since the security barrier was built. In the period immediately following the Oslo agreements, living conditions in the Palestinian territories along the Green Line had improved, thanks to new opportunities to provide labor, artifacts, and services to the Israelis at extremely competitive prices. A lot of this complementarity between the Israeli and Palestinian economies was disrupted by the building of the wall.

The Palestinian Hydrology Group has conducted an investigation on the 37 wells impacted by the first phase of the construction of the Wall. Of these, 22, which had yielded about 4.3 MCM of water per year, were directly impacted, as they were confined behind the wall. The remaining 15, which supply 2.65 MCM of water, were affected indirectly, as the land they used to irrigate now lay beyond the wall. 32 of these wells were in the district of Qalqilya, the remaining 5 in that of Tulkarem. The wall destroyed 12,000 meters of irrigation networks. 37% of the families who had utilized the wells in the districts of Jenin, Tulkarem, and Qalqilya

¹⁵ The Palestinian Environmental NGOs Network (PENGON), *The Wall in Palestine* cit.

¹⁶ World Bank, *Two Years of Intifada, Closure and Palestinian Economic Crisis*, World Bank, Washington 2002.

were deprived of water for agriculture.¹⁷

The conditions for the Palestinians' access to water, and indeed its very possibility, depend on the location of their wells. Palestinian water consumption is drastically reduced under the following circumstances:

1. The well lies west of the wall and the hydraulic network it feeds lies totally or partially east of the wall;
2. The well lies east of the wall, but within the "security zone", i.e., the cushion zone created to prevent attacks against the wall itself;
3. The well lies east of the wall and the hydraulic network it feeds lies totally or partially west of the wall;
4. The well lies in the path of the wall.

The construction of the barrier has had especially negative effects on the private wells dug during the Fifties and Sixties, reducing the quantity of water available for domestic and agricultural uses, and forcing the population to buy tank water for 3 to 5 times the price of private-well water.

Difficult access to water resources is the worst threat to the Palestinian economy. The aquifers supplying the best and most abundant water to the West Bank Palestinians are those of the western Mountain. In the areas of Tulkarem and Qalqilya there are 142 wells, from which the Palestinians extract about 20.4 MCM, about a third of the total yield of the three underground basins of West Bank (60.4 MCM). These were also the areas in West Bank with the highest agricultural yields. The three districts housed 22% of the total population, but accounted for 45% of the overall agricultural production. 60% of their population depended on agriculture for their livelihood, directly or indirectly.¹⁸ According to 2003 data of the Ministry of Agriculture, the decline of the contribution of

¹⁷ Palestinian Hydrology Group (PHG), *Water For Life: Continued Israeli Assault on Palestinian Water, Sanitation and Hygiene during the Intifada*. Water, Sanitation and Hygiene Monitoring Project 2005.

¹⁸ *The Impact of Israel's Separation Barrier on Affected West Bank Communities*, Report of the Mission to the Humanitarian and Emergency Policy Group (HEPG) 2003, p. 11.

agriculture to the Gross National Income was about 75%, mainly as a consequence of land confiscation and isolation following the building of the barrier.¹⁹

In sum, while the water supply issues determined by the construction of the Wall have not attained the proportions of a veritable humanitarian crisis, they certainly pose a major constraint to Palestine's economic development and contribute to the deterioration of the Palestinians' living conditions. A troublesome question is that of uncertainties regarding water property and usage rights. In a number of situations, access to water is unequal not just between the Palestinian and the Israeli population, but within the Palestinian population itself. The Palestinian economy is still based on agriculture. To further reduce Palestine's already scarce water supply and undermine the integrity of the irrigation network is to impede the emerging of a Palestinian economy that is autonomous from that of Israel.

Conclusions

In the light of the unsatisfactory results of past negotiations for the allocation of the water resources of the Jordan basin, can we still look forward to a successful "water diplomacy" in the Middle East? A hypothesis that has been gaining favor lately is that the "water stress" the area has been subjected to for years may eventually act as a catalyst for regional cooperation, since the future of the area now more than ever depends on the satisfying of the water demand in an arid environment exposed to climatic variability.²⁰ Problems such as rainfall fluctuations, aquifer deterioration, and watercourse pollution do not directly depend from the Arab-Israel conflict. However, political instability in the area does stand in the way of

¹⁹ Palestinian Hydrology Group (P.H.G.), *Continued Israeli Assault on Palestinian Water, Sanitation and Hygiene during the Intifada*, Ramallah (Palestine) 2006.

²⁰ I. Ray, G. Baskin, Z. al Qaq, W. M. Hanemann, "Environmental Diplomacy in the Jordan Basin", in *Institute on Global Conflict and Cooperation (IGCC) Policy Papers*, 42, 2001, pp.1-21.

attempts to find common solutions to an environmental crisis that extends beyond national boundaries.

Alternative strategies are required to assuage regional water competition. Above all, confidence building measures are needed. No hypothesis for the allocation of the water of the Jordan basin can be put forward as long as water is used as a means to put pressure on rivals, and as long as deep inequalities in access to water continue to exist between Israel and the other countries of the basin. A new negotiation strategy employing impartial mediators is called for.

In an international basin such as that of the Jordan River, marked by a high imbalance of power and the hegemony of Israel, the involvement of external actors is needed to facilitate the peace process and guarantee equity in the parceling out of common resources. The major international financial institutions should only grant funding to hydraulic projects under condition that they comply with environmental sustainability standards. They should also exert pressure on Israel to put a stop to all use of water as an instrument of political pressure. Incentives to cooperation in the water sector are needed. Something like the “dividends of peace” - as Peres called them - granted in the period immediately following the launching of the peace process in the Middle East. If a virtuous process were activated, involving technology exchanges, the undertaking of common projects, a revival of the tourist sector, improved management and safeguarding of water sources, water could become the motor of regional economic development.²¹

²¹ S. Peres, *The New Middle East*, Holt, New York 1993.